

Strategies for Development of Peri-Urban Areas in a Developing Country (A Case Study of Bhubaneswar)

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ABSTRACT

The world is experiencing a new phenomena – peri urbanism. As the population is increasing and cities are infrastructurally upgraded, there has been a gradual shift of the urban population from the more developed regions to the less developed ones, aimed at availing free open spaces to live, grow and setting up new communities. This movement of urban population in large numbers has led to formation of peri urban spaces. With no such boundary to define the peri urban spaces, these areas are the outskirts of the urban centres which are to be explored. A detailed understanding about the dynamics of urbanisation is necessary for coping with the negative effects poised by urban sprawling on the peri urban areas. Being designated as one of the first smart city of India, Bhubaneswar city is experiencing formation of urban sprawls around the major urban nodes. In order to further examine the need for policy formulation, a detailed study has been done to understand the demographic, economic and social profile of the inhabitants residing within the fringe areas of Bhubaneswar. The empirical approach of the paper is based on the study of the infrastructure and development issues of the area using remote sensing and GIS techniques. The final findings of the study includes the issues, problems and recommendations to be applicable for a planned and controlled development in the peri urban areas of Bhubaneswar.

KEYWORDS: Peri urban Areas, Delineation, Urbanisation, Wiegthed Index method

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1. INTRODUCTION

Peri urbanism has been the result of limited options of development within the existing urban boundaries and has been the main reason towards rationalizing the growth of the urban areas. Therefore, a detailed study needs to be undertaken to understand the dynamics of peri urbanisation in the developing countries, such as India and frame strategies in order to cope with the unplanned, unsystematic and profound impacts of rapid urbanisation on the fringe of smart cities of India. This is so particularly because the dynamic influences of peri urbanisation is being experienced by most of the metropolitan cities of India and in order to make the cities livable, sustainable and productive, appropriate strategies need to be evolved to make these peri urban areas an integral part of the city growth and developmental process.

With advancement in technology and interest towards achieving better living conditions and standards, the world has been experiencing a gradual shift of population from the backward areas to the advanced, facilitated areas. India, the emerging economic power in the world, contributes nearly 17% of the world's total human population, covering 2.4% of the world geographic surface area (MSPI, 2011). There has been a rapid growth in the world population from 751 million in 1950 to 4.2 billion in 2018 (DESA, 2018). It is expected that 37 percent of the projected world's urban population between 2014-2050 will reside in India, China and Nigeria put together (DESA, 2014 Revision). The degree of urbanisation has increased from 11% in 1901 to 31% in 2011 (Kumar & Rai, 2014). Such rapid urbanisation acts as

the major reason towards creating various social, economical and environmental changes, with provision for sustainability such that there is an efficient utilization of the resources, creation of sustainable land use and protection of the biodiversity of natural ecosystems.

Large number of studies has been done to understand the concept and applicability of peri urbanism. These theoretical approaches of peri urbanism include definitions and models explaining the factors that lead toward the formation, development and growth of peri urban areas or urban fringes. Understanding these approaches will help in framing of strategies for controlled development in the peri urban areas. According to Wehrwein, the peri urban areas are the transitional areas (Wehrwein, 1942). Therefore, greater attention is required towards understanding the changes in land use patterns of the peri urban areas, due to rapid urbanisation in urban areas (Stow & Chen, 2002).

It is observed that peri urban areas are generally enriched with significant ecological, bio-diversity, landform, natural character, landscape and cultural/natural heritage values that are required to be rationally studied and planned with sensitivity (Simon, 2008). Evidences suggest that, appropriate measures need to be evolved to make them an integral part of the city growth and developmental process. From the above literature, it is clear that unplanned growth in urban areas has resulted in urban sprawl and this has led to shifting of population away from urban nodal areas to the less infrastructured and less developed peri urban areas.

Thus, the rationale of the present paper lies in understanding peri urban dynamics through land use changes and studying the reasons behind the unplanned, unregulated development in the fringe areas of the city. It is anticipated that the findings of the paper will help in framing urban development policies and a comprehensive framework for its planning and development. In addition, recommendation provided in the paper will be helpful to carry forward further research on sustainable utilisation of peri urban land and its planned development at three levels – at city level, at municipality or panchayat level and at beneficiary level.

2. STUDY AREA DYNAMICS

The study is concerned with the Bhubaneswar Urban Development Area (BUDA) located in the Khordha District of the state of Odisha. Fig.1. cites BUDA is the amalgamation of Bhubaneswar Municipal Corporation (BMC) (67 wards), Jatani Municipal Corporation (JMC) (23 wards), Khordha Municipal Corporation (KMC) (22 wards) and the rural areas, that includes 473 revenue villages, spreading to an area of 393 square kilometres. The area is under the jurisdiction of the Bhubaneswar Development Authority (CDP, 2010). The study area spreads to a length of 38 kms from north to south; and a length of 50 kms from east to west. Bhubaneswar, is the capital, largest and the most urbanized city within the state of Odisha. As per 2011 census, Bhubaneswar had a population of 8.37 lakhs, experiencing a decadal growth rate of 45.90% (Census of India, 2011).

Fig 1 Geographical setting of Bhubaneswar Urban Development Area



Source: Primary Analysis

A few variables such as land use, demography and socio-economic characteristics, etc. will be duly considered (Singh & Vyas, 2014) (Dutta, 2012). On the basis of these indicators the case study areas have been selected.

3. SELECTION AND DELINEATION OF STUDY AREA

In order to address its research objectives, the paper emphasizes upon delineating the study area and focusing on a particular region, so as to study in detail the requirement of formation of strategies for these peri urban regions. A list of parameters to be considered has been described in the URDPFI Guidelines (URDPFI, 2014). For the delineation of our study areas, the population, population density, literacy rate, agricultural participation rate and the important growth areas within our study area are being considered as the important criteria's.

As mentioned in the URDPFI Guidelines, it is recommended that the delineated region should have a nodal point, that has

either been developed or is in the transition stage of developing. In the analysis of peri urban areas, a study by Pryor has been referred to in the paper. As per Pryor, the fringe areas are defined as the zone of transition in land use, social, physical and demographic characteristics lying between the continuously built-up urban and suburban areas of the central city and the rural hinterland characterized by almost complete absence of non-farm dwelling, occupations and land use.

Different delineation methods for delineation purpose also exists, such as, Weighted Index Method, Flow Analysis, and Gravitational Analysis Method. Briefly discussing the delineation methods, the Weighted Index Method approaches towards criteria's that can be used to divide the regions and then determining the homogeneous regions with certain variations or deviation limits. The Flow Analysis Method emphasizes upon building up the direction of flow and functional relationship between the nodal centre and its surrounding regions. In this method, the functional relationship among the regions are defined through line graphs. Lastly, the Gravitational Analysis Method can be used when an analysis is done based upon the distances between the functional and the nodal centres. This can be used to plot the sphere of influence within the regions.

This paper has used the Weighted Index Method to delineate the study area. As discussed in the paper, the population, population density, literacy rate, agricultural participation rate and the important growth areas within our study area are being analysed to zero down to the regions that will be used for studying and framing strategies for the planned development of peri urban areas.

3.1. Population distribution and Population density:

The paper has analysed the population distribution and population density panchayat wise within the study area. It is clearly indicated the distribution of population is basically on the northern and eastern parts of the study area. This is because of the major urban centres located in its vicinity, i.e., Bhubaneswar on the west, Cuttack on the north and the major transit corridors running within this region, which includes the N.H 16, S.H 60 and S.H 316. Corresponding to the population distribution, the population density is also high in these regions. This indicates that the majority of the population has been residing in these areas with pretext of education, profession or finding budgetary residences. Thus, development in these areas will be at a faster rate than the other regions. The figure clearly indicates that the population and population density is high in the Baliaanta and Balipatna block, as well, as some regions of the Bhubaneswar block, spreading unevenly to the northern and the southern part.

3.2. Literacy Rate:

The study indicate literacy rate is almost at a good rate throughout the entire study area, particularly highest in the eastern, northern and north-western part. The high literacy rate in these areas indicates the confluence of both educational institutions, commercial complexes as well as institutional buildings that makes it a focal point for literates to flow in and out of these regions. The literacy rate determines the future acceptability rate of the residents of those regions towards the new strategies formed for the planned development of the areas, as well as, a high success rate in the application of a holistic approach towards the upgradation of these peri urban regions.

3.3. Agricultural Participation Rate:

The representation of the data is a major help in locating the regions where cultivation and agricultural activities are still been undertaken and it is a requirement to retain this work culture in these regions. The major agricultural activities are being undertaken in the southern and south-western regions of the study area. Sparse or very less agricultural activities are been taken up in the northern and the eastern part of the study area. The recommendation of the research paper should be careful at not affecting the agricultural activities being undertaken in our study area.

The paper has made a cumulative assessment of the allotted weights to the three criteria's as discussed above in detail. On the application of the Weighted Index Method, a final figure has been generated which provides the region delineated for further study. Fig.2. is the final output of the three maps superimposed. The map defines the area that are the major growth zones within the fringe area. The areas considered has the following output –

1. high population distribution,
2. high population density,
3. high literacy rate and
4. low agricultural participation rate.

Taking into consideration of the above outputs, the most suitable areas has been obtained. Since the areas have been marked in a scattered manner, a close knit grouped area has been considered as the study area, i.e, the Baliana and the Balipatna block.

The delineated study area is well connected to various major points by important transportation nodes – N.H 16, S.H 316 and S.H 60. There are water bodies present within the delineated region, i.e, the Kuakhai river and the Puri Canal. Since the delineated region has a low rate in agricultural activities, therefore it explains the movement of the people residing in the region for accessing the daily basic needs and availing employment opportunities. It is required to understand the reasons of movement of people to and from the selected region, as well as, the distance travelled to reach the destination.

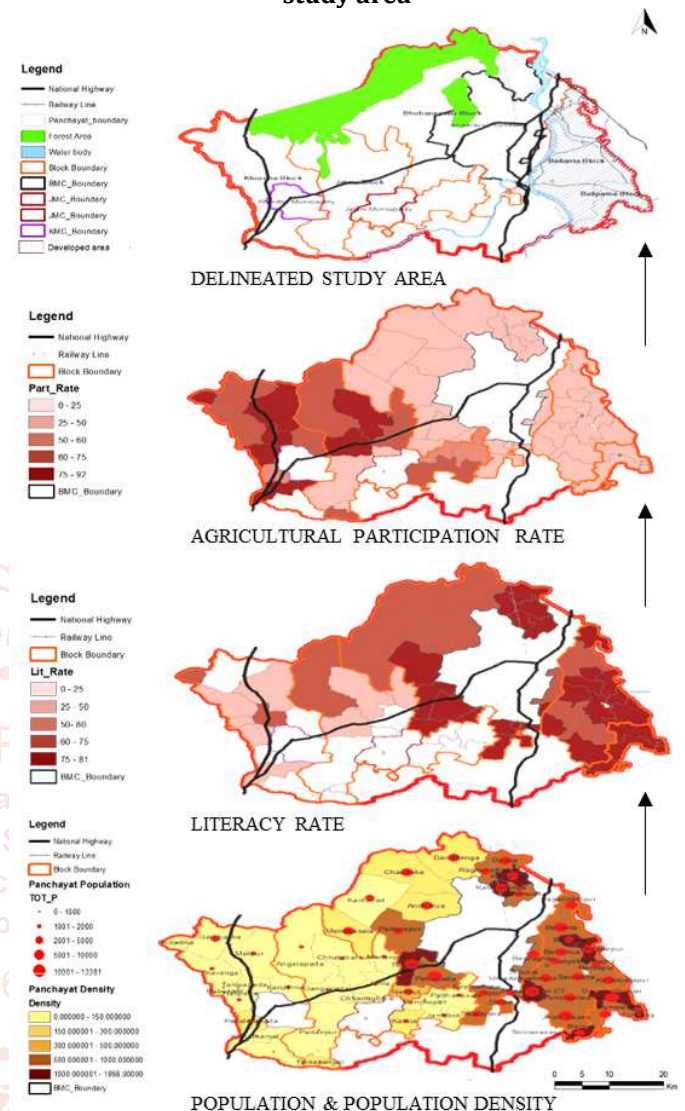
3.4. Development pattern of the study area:

A study for spatial patterns of land use changes for the delineated region for the year 2005, 2011 and 2019 has been done. It is observed that there has been an increase in the commercial and mixed land use by almost 30%. It is further marked that the residential land use development has been dominantly expanding in the peri urban a areas. There has been a spontaneous conversion of vegetation and agricultural land into new urban development spaces. A major chunk of development is taking place within the delineated region towards residential development. Therefore, this is a major attraction for the people to invest in the area for buying or renting a property, since it is very costly to invest within the urban nodes.

As explained by Wehrwein, the Rural-Urban Fringe areas are “the transitional areas between designated urban areas and

area for agriculture”. Therefore, these Fringe areas can be considered as the transition zone where one can find upcoming mixed land use development.

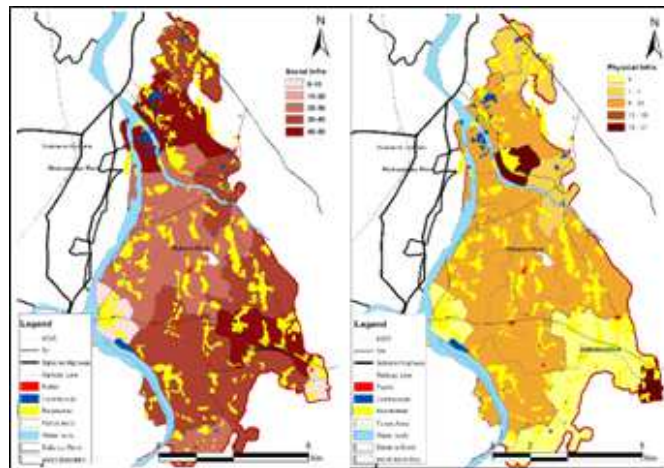
Fig2 Superimposition of maps for Deleneating the final study area



Source: Primary Analysis

3.5. Assessment of existing physical and social infrastructure of the delineated area:

An assessment has been done which shows the existing social and physical infrastructure (panchayat wise) for the delineated fringe area. The calculation for the physical infrastructure has been calculated as per the index marking and for the social infrastructure as per the available numbers. These observations are supported by the data's obtained from the respective panchayats and the municipality. The map clearly indicates that the physical infrastructure facilities are sparsely available in the region whereas, the social infrastructure facilities is in a satisfactorily position in terms of availability.

Fig 3 Panchayat wise existing social and physical infrastructure in the final study area**Source: Primary Analysis****4. MAJOR FINDINGS**

The study of land use changes and infrastructure availability in the delineated region provides us the following major findings:

- A. The settlements have come out mainly along the transit corridors i.e, National Highways -16, state high ways and also near the major growth centres.
- B. The fringe characteristics vary from one zone to the other in terms of provision of infrastructure facilities, income generation, density and connectivity.
- C. The authorized and unauthorized constructions has gained momentum in fringe areas due to increase in demand of land and housing.
- D. The majority of the people are investing as the land value is lesser in the fringe than in the city limits.
- E. The agricultural lands in the peri urban areas are being converted into urban use at a greater extent due to the high demand.

5. PROBLEMS & RECOMMENDATION

Level	Parameters	Problems & issues faced	Recommendations
At city level	Affordability and the availability of land.	High land value and scarcity of availability of land within the city boundary is beyond the affordable limits of the middle- and lower-income group people. As a result, the people are moving to the fringe area with expectation of a better and affordable option for housing.	The key instrument to achieve systematic peri urban development by legalising the procedure of land acquisition process by using scientific techniques like e-governance, e-seva, etc and making it simpler and user-friendly. This leads the process to be less time consuming and reduction in manpower requirement. A single-window approach should be adopted for simplifying the procedures. All the data related to land, land development, ownership status, list of unauthorized and authorized developments, impact of developments on land markets, government schemes, record of transactions, etc. should be compiled and updated from time to time and these records should be made available to all the government departments, private developers, co-operatives and the communities.

	Land acquisition process	The land acquisition process is very lengthy and time-consuming process, for which most of the authorized development works get delayed. To avoid the lengthy procedural work many of the developments are taking place illegally on the fringe.	
	Price of land along transport corridors	The development along the major growth corridors, the price of the land is increasing tremendously every year, which has resulted in high speculation along the transport corridors which needs to be controlled.	Appropriate measures for conservation of the agricultural land and rural livelihood by value added farming in the high agricultural potential areas.
At Municipalities/ Panchayats level	Regulatory body for planned development	The Urban Local Body has power to sanction or cancel building plan and the layout plan and land subdivision within their jurisdiction areas. But the local bodies particularly Panchayats are unable to take actions against the unauthorized developments because of lack of power unavailability of qualified technical persons. This has led to deterioration of quality of environment in the fringe areas.	A sector plan will contain guidelines for future development and this must include the clear distinction of each land use, rural-urban components and major networks and amenities for the area. There must be appropriate regulatory structure to bring harmony in land colonization and an easy approach towards development of infrastructure by the developers. Monitoring and revision of the sector plans must be done at regular intervals, once in every three years.
	Zoning regulations	It has been observed that many of development have come up adjacent to the village Abadi area which is a violation of zoning regulations. The authorities are not able to recover the development charges which can lead to the haphazard growth on the fringe as well as it is a great revenue loss to the authorities.	The zoning regulations must be revised for the immediate surroundings of the villages as these areas are under strong urban influence. Special development control or bye-laws must be evolved to regulate the development inside the villages.
At beneficiary level	Controlled development	The beneficiaries in the unregulated areas face the problem of availing various physical and social infrastructures such as, road, water supply, drainage as well as the amenities like school, park, hospital, etc.	Finally, residents in the peri urban areas should be made aware about the ill effects of rapid, unplanned and unsystematic development. They must be approached by the local body to get involved in the regularising of the land and buildings already constructed and get required approval for future constructions.

Source: Primary Analysis

CONCLUSION

The present paper is an attempt to study the problems and issues of unplanned and unregulated development in the peri urban areas of Bhubaneswar. It is observed that from the year 2005 till 2015, there has been a loss in agricultural land percentage and an increase in the built up land cover. The substantial reduction in the percentage of agriculture land in the outskirts of the urban nodes is a generalised effect of peri urbanism. But the study also reveals the unplanned development in the fringe areas of the city.

Thus, this rapid, unplanned, scattered urbanisation intimidates the urban development and infrastructure provision and upgradation processes. In order to control this unregulated sprawl, there is a necessity to prepare a regulated approach to ensure the proper use and management of land, water bodies and natural environment. A holistic approach is necessary with significant proactive role of the local body, i.e, municipality, panchayats and the beneficiaries of the urban development (Patra, Sahoo, Mishra

& Mahapatra, 2018). This calls for an effective integration of the functions performed by various departments or agencies under the state government. Application of appropriate policies will help in regulating the unplanned, unregulated, unsystematic development in the peri urban areas of Bhubaneswar city.

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